

FRASS AS AN ACCEPTABLE PABULUM FOR LEAF-MINING LARVAE. — On 29.viii.1975, I collected a leaf-mine of *Stigmella ruficapitella* (Haworth) [Lep.: Nepticulidae] on *Quercus* in Parkhurst Forest, on the Isle of Wight. It soon transpired that *Ectoedemia albifasciella* (Heinemann) was also mining this leaf, although *S. ruficapitella* had vacated its mine before *E. albifasciella* had finished constructing its gallery stage. Several times the larva of *E. albifasciella* found itself in a situation such that it was forced, since it could cross a previously-constructed mine in no other way, to consume frass, which was sometimes its own, and sometimes that of *S. ruficapitella*. Observation under the microscope suggested that the larva showed an equal preference for frass and for its natural pabulum. On the one occasion when the larva was faced with a choice between its own frass and that of *S. ruficapitella*, it tasted each, and proceeded to eat its own.

The larva seemed to flourish on its mixed diet, and, in spite of its slower than usual growth and of its brown, rather than green, gut, fed up, and successfully produced a fully-sized imago on 17.iv.1976.

Food passes through the guts of leaf-mining larvae extremely quickly: ingested food may well be voided as frass within a quarter of an hour of consumption. Consequently, it is only partially digested, and retains a high degree of nutriment. Hering (1951, *Biology of the Leaf Miners*, 's-Gravenhage, pp. 289-290) states: "The mining larva's frass . . . contains a considerable quantity of nutrient substances, even though the protein constituents are missing".

Many leaf-mining larvae seem to be very tolerant of their frass: many *Phyllonorycter* [Lep.: Gracillariidae] incorporate their frass into their cocoons. Not infrequently, larvae of Nepticulidae of the *atricapitella* group, when they feed in the late autumn, find their dwindling "green islands" insufficient for their needs. Often, they will then continue to subsist on their own frass. Col. A. M. Emmet collected a mine of *Stigmella atricapitella* (Haworth) at Lopham Fen, Norfolk, on 17.xi.1973, which fell into this category; yet it yielded a fully-sized imago on 6.v.1974. The moth and its highly unorthodox mine were exhibited at a meeting of the British Entomological and Natural History Society on 27.vi.1974.

Externally-feeding larvae do not seem to be tolerant of their frass; many semi-external feeders, however, do (e.g. members of the genera *Parornix* and *Caloptilia* [Lep.: Gracillariidae], but these do not actually eat their excrement).

I am very grateful to Col. A. M. Emmet for looking after and observing the specimen of *E. albifasciella* herein described during a period of my absence. I am also grateful to him for the provision of information on his experiences showing tolerance by leaf-mining larvae of their frass. — P. J. JOHNSON, 7 Haverhill Road, Horseheath, Cambridge, CB1 6QR, 27.x.1976.